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# Context is What We Take For Granted: Addressing Context in Design-Centric Teacher Training

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**Abstract.** This paper discusses two recent graduate courses in educational technology, and contrasts them with previous work in the context of Participatory Pattern Workshops (Mor, Winters, and Warburton, 2010). Both courses were based on a design studio model, where students worked in teams and were asked to identify an educational challenge and address it using an appropriate technology. The paper considers the importance of developing an awareness of context for the training of educational designers, and presents a particular tool, called force-mapping, used for this purpose. It contrasts the success of this tool in one setting with the relative difficulties it encountered in the other, and suggests some possible explanations for this discrepancy.

**Keywords:** context, learning by design, teacher training, mobile learning, game-based learning, methodologies, representation, force mapping, narrative, design narratives, design-based research.

## 1 Introduction

Recent years have seen a growing acknowledgment of the value of training educators as learning designers (Kali & Ronen-Fuhrmann, 2011; Ronen Fuhrmann, Kali and Hoadley, 2008; Laurillard, 2008; Cross et al 2008). Design is always contextual, and thus, in order to become reflective learning designers, educators must learn to appreciate and articulate contextual factors.

This paper considers two recent graduate courses in educational technology, and contrasts them with previous work in the context of Participatory Pattern Workshops (Mor, Winters, and Warburton, 2010; Winters and Mor, 2009; Mor and Winters, 2008). Both courses were based on a design studio model, where students worked in teams and were asked to identify an educational challenge and address it using an appropriate technology. One course focused on mobile learning, while the other on game-based learning. The majority of students in both courses were active educational practitioners.

Students were provided with a project website template, which guided them through the design process. One of the first steps they were required to do was to

define the context in which they situated their project, and to try to phrase the educational challenge in terms of tensions between forces within this context. Students were asked to describe the context both verbally – noting the educational, technological and institutional environment and the target audience, and graphically – using a force map (described below).

By and large, students failed to adequately describe the context for which they were designing, and this failure led to inadequate design solutions. Only when these solutions were challenged in class, did students revisit and occasionally refine their descriptions. This stands in stark contrast to our experience from the Participatory Patterns workshops, where participants successfully articulated rich descriptions of their context and used these to design seemingly appropriate solutions. This paper considers the possible causes for this discrepancy.

## **2 Background**

Extensive research over the last decade highlights the complexity of learning design and the design of learning technologies (Beetham & Sharpe, 2007; Mor & Winters, 2007). This calls for an emphasis on training educational practitioners as learning designers (Goodyear, Markauskaite, & Kali, 2010; DiGiano, Goldman & Chorost, 2008). Furthermore, engaging students of education in design is an effective means of enhancing and entrenching their subject knowledge (Koehler & Mishra, 2005; Ronen-Fuhrmann, Kali & Hoadley, 2008).

Tabak (2004) stresses the tight relationship between design-based research (DBR) and educational context. A design perspective focuses on educational innovations, and acknowledges that such innovations need to be interpreted with respect to the context in which they are embedded. Design practice and design research deal are both committed to affecting change in real-world situations, and thus can only succeed if they pay close attention to the unique configuration of these situations.

When we set forth to train learning designers, we need to develop their ability to notice, describe, and analyse context, and systematically refer to it in the solutions they propose.

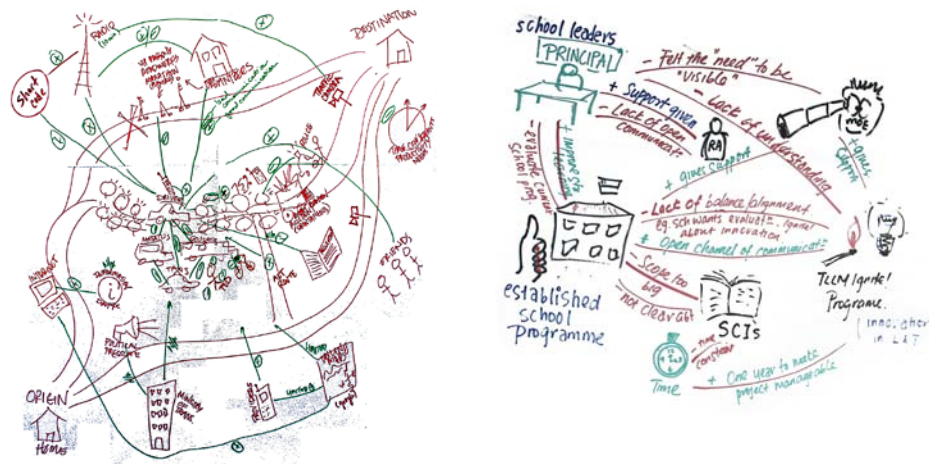
### **2.1 The Learning Design Studio**

One approach which appears to hold significant promise in training learning designers is the learning design studio (Kali & Ronen-Fuhrmann, forthcoming; Hoadley & Cox, 2009; Cox, Harrison, & Hoadley, 2008). This approach is modelled after the tradition of studio-instruction in arts and design disciplines (such as architecture). In this model, the main activity of a course is the students' continued work on design challenges in a defined domain of practice. Students typically work in groups. They identify an educational challenge, research it, and devise innovative means of addressing it. The course instructor guides the students through the process, and classroom sessions are mostly dedicated to group work and public review of design artefacts.

## 2.2 The Participatory Pattern Workshop methodology

The Participatory Pattern Workshop methodology (Mor, 2011; Winters, Mor and Pratt, 2010; Winters & Mor, 2009; Winters & Mor, 2008; Mor & Winters, 2007) was developed as a framework for engaging practitioners in collaborative reflection on their experiences in designing for technology-enhanced education. At its core is a series of workshops, in which participants share their experiences through a structured process of telling stories – design narratives (Mor, 2011), abstract design knowledge from these narratives in the form of design patterns, and validate them by applying them to future scenarios.

These workshops drew on a set, or “toolbox” of techniques for facilitating effective reflective discussions. One particular technique which specifically addressed the need for capturing a description of the context was *force-mapping*: a practitioner would present her design narrative to her group members, and they in turn would interrogate her to identify the forces in play in the situation she describes: the actors, their beliefs, constraints, desires and the environment in which they operate. They would then sketch visual representations for these and note the relationships between them – marking “+” for supporting relations and “-” for conflicting ones.



**Fig. 1:** Examples of force maps from two workshops: one on mobile learning in Kenya, the other on institutional support for educational innovation in Singapore.

## 3 Capturing Context in Two Design Studio Courses

During the academic year of 2010-2011 I taught two courses using a design studio structure: one in game-based learning, the other in mobile learning. In both courses, students were first asked to outline an educational design initiative: a challenge, in a particular context, and a possible path of solution. They then formed groups around common interests and chose one of the proposed initiatives and develop it, as a term-

long group project. Students were provided with a web-site template, to scaffold their project work. They created a site for their project from this template, and were expected to edit it as they went along. All feedback was provided based on the content on the project sites.

One of the tasks in the project work was to fill in a “context” page on the project site. The instructions asked students to provide a textual description of the educational, technological, and institutional environment of their project, and define its target audience. They were then asked to draw a force map of the project context (Fig. 2), and add a record of existing practices using photographs, video clips and observational sketches (Fig. 3).

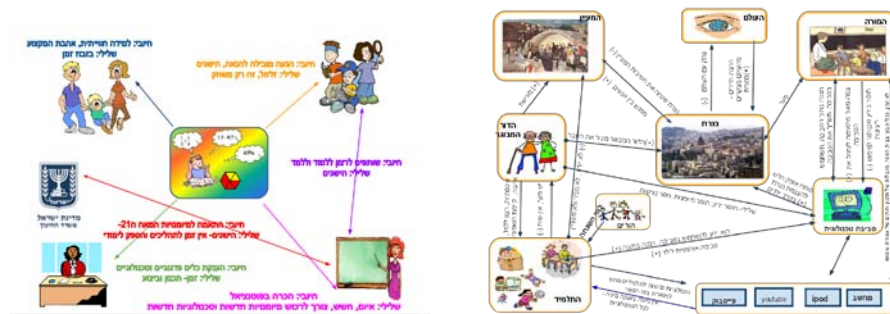


Fig. 2: Examples of force maps from game-based learning course.

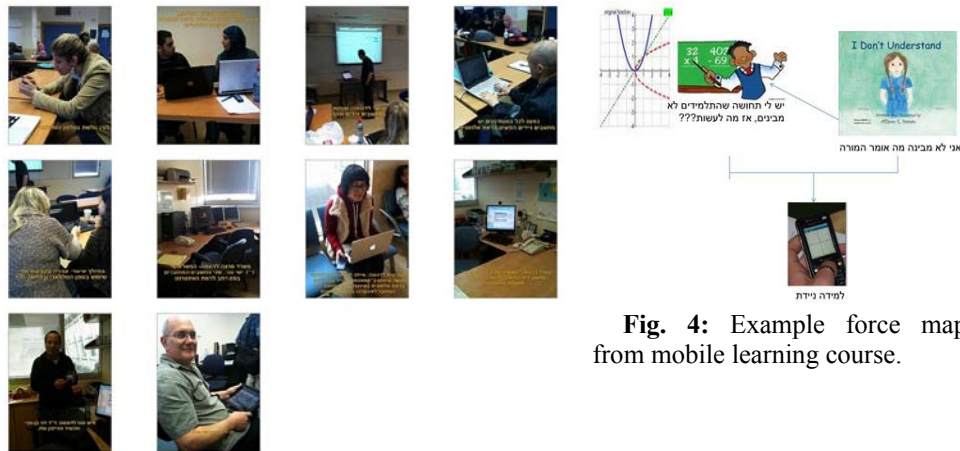


Fig. 4: Example force map from mobile learning course.

Fig. 3: Example of images documenting project context from mobile learning course.

The second example in Fig. 2 seems fairly elaborate, and indeed – this team eventually produced an ambitious and sophisticated technology-enhanced learning design, which reflected their analysis of the cultural, social, geographical and technological context in which they operate. However, this was the exception. Most force maps resembled the first example, or even the one in Fig. 4.

Consequently, students’ designs either did not match the context of their project, and consequently this mismatch led to difficulties in implementation, or else they

relied on their intuitive familiarity with their natural work environment, and substituted ad-hoc responsive tweaks for pre-meditated design.

A careful analysis of the students' work is currently in progress, and hence any conclusion must be taken with great caution. Yet it appears that one of the weaknesses of both courses was the description and analysis of projects' context, and this weakness had an adverse impact on the quality of design. This observation stands in stark contrast to the participatory pattern workshops, where it seems that participants managed, in a very short time frame, to produce intricate force maps providing rich descriptions of their contexts. This contrast calls for a comparison of the conditions in the two situations. Clearly, these are highly distinct cases, and it would be hard to pin down the variance between them to any particular factor without further investigation. However, three differences stand out – and raise conjectures regarding possible causes for this variance.

The first notable difference is the medium: in the pattern workshops, participants drew their maps with markers on large sheets of paper, while in both courses they were encouraged to use various collaborative sketching programmes. This led to very different behaviour – in the first case, participants had to create visual representations of their idea, while in the second they searched and selected existing imagery, in the first case several participants could hold pens and scribble simultaneously, using the paper as an arena for discussion, while in the second conversation tended to remain off-screen, with one student holding the mouse and expressing her interpretation of the group's ideas.

The second difference is in the positioning of the force-mapping within a sequence of activities. In the pattern workshops, participants were asked to construct a narrative of a challenge they are contending with, and then distilled the force map from that narrative. One of the critical epistemic steps in narratising experience is the selection of the elements of context and the events to include in the narrative. In the process of narratising their challenge, participants' awareness to the critical elements of their context was perhaps primed, and then articulated explicitly in their force maps.

The third difference is related to the second. In the workshops, participants worked in heterogeneous groups, and thus were constantly required to elaborate their implicit assumptions. In the courses, students believed that their team mates are familiar with their context, and thus allowed themselves to assume common knowledge of the relevant context.

Although it is early to say with confidence that these three issues were indeed the determining factors in the students' difficulty with articulating their projects' context, they are clearly present, and could provide a highly plausible explanation for the observed difficulty. Clearly, to gain a higher degree of confidence, would require careful examination of the data, and possibly further experimentation. Nevertheless, these observations do raise some valuable questions, as discussed in the next section.

## **4 Discussion**

This paper briefly described an approach to training educational practitioners as learning designers. This approach is based on the idea of a learning design studio. It

highlights the importance of context – its description, articulation and analysis – in the design process. The paper considers two recently taught courses which implemented this approach, and specifically used a technique called force mapping for identifying and expressing context. Students in these courses encountered difficulties in this aspect, and these difficulties were contrasted with the success of the technique as it was used in participatory pattern workshops. Three differences between the courses and the workshops were proposed as factors contributing to this difficulty: the medium in which maps were produced, the relationship between the maps and design narratives, and the heterogeneity of the workshop groups.

As the full analysis of the data is still in progress, these proposals need to be taken with caution. Nevertheless, they raise some important questions regarding practitioners' understanding of the context in which they operate. This understanding is tacit by nature, and thus hard to articulate: the environment you know well seems natural; the details fade into the background. None of the educators involved described the physical layout of their class – because for them they were familiar and thus, obvious. On the other hand, any given context includes endless details. How does one choose those which are relevant to the design challenge at hand? The participatory pattern workshops seem to offer a possible answer to these questions. First, the requirement to sketch the elements of the context, and the need to explain them to peers who are not familiar with them, forced participants to reflect and refine their conceptions. Second, the process of narratisation invoked an innate mechanism of judging and selecting the pertinent details and separating them from the invariant ones. Further experiments will determine the robustness of these claims.

On a final note, it would appear that the difficulty of binding a context to a design challenge is related to the problem of concretisation identified by Kali and Ronen-Fuhrmann (forthcoming), and the resolution of both of these issues reflects a process of situated abstraction (Hoyles, Noss & Kent, 2004; Noss & Hoyles, 1996) – albeit in a setting very different from that in which this concept was conceived.

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